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ABSTRACT

During the 1960s, many rural local governments were believed to provide inadequate government services, which hindered rural development. Rapid growth in government spending has reduced the incidence of government poverty from 78 percent of nonmetropolitan counties in 1962 to only 7 percent in 1987. Those counties still government-poor in 1987 spent only 61 percent of the average for all nonmetro counties. Relatively few nonmetro counties are substantially short on public services such as health, education, road maintenance, and police protection. However, government poverty continues to be a significant problem in totally rural areas, in the South Central part of the country, and in retirement and low-income counties. When expressed in real dollars per capita, the spending gap between government-poor and average nonmetro counties grew substantially more for education than for sewage and sanitation, and highways and transportation. However, when expressed in percentage terms, government-poor counties' spending on education still appears closer to the nonmetro average than spending on the other functions examined. The relatively better performance in education may be due to court-imposed legislation to equalize school financing that increased state aid to education, and due also to federal aid to poor school districts. The document contains several tables and figures. An appendix on regression analysis includes a discussion of conceptual problems in relating results to the current national policy debate. (KS)

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United States Department of Agriculture

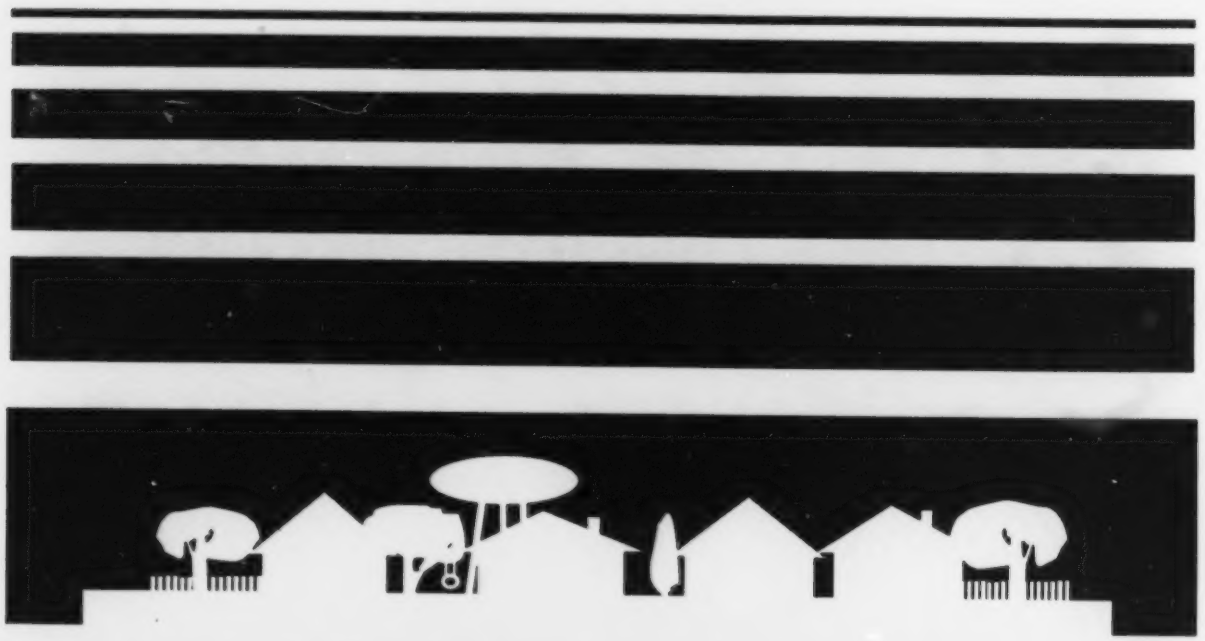
Economic Research Service

Rural Development Research Report Number 88

Rural Government-Poor Counties, 1962-87

Richard J. Reeder
Anicca C. Jansen

ED 383 499



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Abstract

During the 1960's, many rural local governments were believed to provide inadequate government services, which hindered rural development. Rapid growth in government spending has substantially reduced the incidence of government poverty. By 1987, relatively few rural areas could be considered government poor. However, government poverty continues to be a significant problem in totally rural areas, in the South Central part of the country, and in retirement and low-income counties.

Keywords: Government spending, public services, local government, rural development, poverty

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Summary

A new study of rural local governments shows that public spending has increased significantly during the past 25 years, leaving relatively few nonmetro counties substantially short on public services. Such services as health, education, road maintenance, and police protection play an economic role in rural places and greatly influence the quality of life. Earlier studies had recorded considerable nonmetro "government poverty," that is, the relative lack of local government spending on public services.

This report describes this type of government poverty in rural counties and shows where it is found. It uses the latest available data on government expenditures to identify the local public finance trends and demographic characteristics of those nonmetro counties that spent relatively little by historical standards on local public services. County-level expenditures from the Census of Governments (1962-87) were adjusted for inflation and other costs using regression analysis, and a threshold for government poverty was drawn based on the level of real adjusted per capita expenditures corresponding to the 20th percentile of nonmetro counties in 1977.

Rural government poverty declined substantially during the 25 years of the study, from 78 percent of nonmetro counties in 1962 to only 7 percent in 1987. The main explanation for improvements appears to be widespread spending increases fueled by economic growth and increased Federal and State aid to local government.

Certain factors mark government-poor places. Government poverty exceeded 10 percent of the counties in 1987 only in totally rural areas, in the South Central region, in low-income counties, and in retirement counties, with this last providing 44 percent of affected areas. In contrast, by 1987, government poverty had disappeared in urbanized nonmetro counties and in the New England and Pacific regions.

Some problems remain. Those counties still government poor in 1987 spent only 61 percent of the average for nonmetro counties in that year. Many have low tax bases and face difficulty in raising tax rates. Federal and State aid does not seem particularly targeted to these places, and expertise to seek grants is often lacking. Spending in these places has fallen relative to the nonmetro average, and dramatic improvements are not expected. Although conditions are much better in counties that have risen above the government-poverty level, many of these counties may be falling behind the growing demands for police protection, environmental and educational improvements, and economic development.

Rural Government-Poor Counties, 1962-87

Richard J. Reeder and Anicca C. Jansen

Introduction

During the 1960's and 1970's, various Federal programs were created to help alleviate rural poverty and stimulate rural economic development. These programs often subsidized local government facilities and services which were expected to assist the poor and facilitate economic development (Rasmussen). Many programs were targeted using conventional poverty measures. Such measures, however, focus on goods and services consumed in the marketplace and ignore the level of local government services consumed. For this reason, Thomas Stinson (1968) created the concept of "poverty of governments," drawing a poverty line to identify those rural places with inadequate local government services.

Local government services have improved since the 1960's, helping to make many rural areas more viable places to live and work. Yet, government services may still be inadequate in some parts of rural America, adversely affecting the economy and quality of life in those places. Though rural residents take pride in many aspects of rural living, complaints are still heard about school closings, poor road conditions, poor-quality water, lack of quality health facilities, and other problems with services typically provided by local government.

Among the causes of poor government services in such places are the high costs of providing services to small, dispersed populations and the inadequate management and technical expertise available to local government in rural areas. The most commonly cited problem, however, is the lack of financial resources, and this is reflected in relatively low levels of local government spending.

How many nonmetro places can be characterized as government poor in the sense of spending too little on local government services? Are these places increasing or decreasing in number? Where are they located? What explains their low spending levels? Are Federal or State programs targeted to these places? Can government-poor areas afford to raise taxes to pay for more services? Is it likely that rural government poverty will be eradicated in the near future? This study attempts to shed light on these questions, directing the attention of researchers and policymakers to this important but often neglected economic development issue.

How We Identified Government-Poor Places

Any effort to draw a precise "poverty line" between adequate and inadequate levels of public expenditure is plagued by conceptual questions, such as adequate by whose standards? local? State? national? international? and adequate for what purpose? satisfying political or legal mandates? addressing America's pressing social problems? upgrading the economy to be more competitive?

Past efforts to draw a poverty line for rural local government spending have not tackled these problems directly. Rather, the line has been drawn one standard deviation below the average level of spending for some subset of typical local governments, or between the top 85 percent and the bottom 15 percent of such places, ranked by government spending per capita (Stinson, 1968, 1985, Stinson and Larson 1985). This poverty level of per capita spending, computed for a benchmark year, has then been used to show historical trends in the percentage and types of counties that fell below the benchmark poverty level in various years.

Our study employs a modified version of the government expenditure approach used by Stinson to identify rural (nonmetro) counties with "poverty" levels of public services. We refer to these as "government-poor" counties. In keeping with Stinson's earlier work, the nonmetro county area is the unit of analysis. County-level local spending data (the sum of all current general spending from all types of local governments within the county) were obtained

from the Census of Governments for various years (1962, 1972, 1977, 1982, and 1987) to identify trends over time. Census' county-level government finance data file (File B) was not available for 1967; the latest data available were for 1987.

Current general expenditures were used as the expenditure variable. This includes spending on services that are funded by Federal and State revenues but are directly spent by local governments. It excludes direct spending by Federal and State governments and local government spending on nongeneral functions, such as publicly operated utilities, the functions of which are provided by the private sector in many parts of the country. Also excluded are capital spending as well as retirement and interest payments that do not reflect current levels of public services.

Our study included 2,357 nonmetro counties. Nonmetro counties are defined for the purpose of this study as those county areas that were outside of Metropolitan Statistical Areas in 1983, as defined by the Office of Management and Budget. Metropolitan counties were excluded from the analysis. In addition, nonmetro Hawaii and Alaska, as well as a few nonmetro counties on the continental United States that lacked consistent 1962-87 data, were excluded from the analysis.

Our main modification to Stinson's approach was our use of regression analysis to "adjust" local government expenditure for factors that affect the local cost of providing government services.[1] For example, some States directly provide services that, in other States, are left to local governments to provide. In States where such services are provided at the State government level, it costs less for local governments to provide the remaining basic public services.[2] Costs may also vary depending on commuting patterns. For example, local governments in residential ("bedroom") communities do not have to deal with the costly peak load problem that local service/employment centers experience.[3] In addition, places with low population densities face diseconomies in the provision and delivery of services, adding to the cost of local services. This reflects the view that there are economies of scale in provision of public services, meaning that the per capita costs of providing public services fall as a place's population size and density rise and as it becomes more urban in character.

We used multiple regression analysis to estimate the extent to which these cost factors explained variations in local government expenditures. Local government spending was then adjusted to remove the variation explained by the cost factors. These "adjusted expenditures" were then used to draw the government poverty line. Appendix tables 1 and 2 give totals for the number of counties that fall below this government poverty line in each State, shown first by the unadjusted and then by the adjusted methods.

Our regression model, discussed in more detail in the appendix, involves one control variable (per capita income) and five cost factors (State centralization, percentage of employees commuting, population, population density, and percentage of population residing in the rural portion of a county). The model explained 42-49 percent of the variation in local spending per capita, depending on the year examined. Although our model is fairly simple, we believe it is an improvement over past efforts, which did not adjust spending levels for cost factors. In the appendix, we show that the most significant differences between our cost-adjusted estimates and estimates made without adjusting for costs were in the earliest year studied, 1962. In later years, such as in the 1980's, the cost adjustments made much less difference in the number of government-poor counties.

We computed a weighted average of the cost factors and their corresponding regression coefficients for each county and for each year. This became our adjustment factor, which we subtracted from actual per capita spending to get adjusted per capita spending (expressed in 1977 constant dollars). We then drew a poverty line at the level of adjusted per capita expenditure below which 20 percent of nonmetro counties fell in 1977.

By comparing adjusted spending for each county in each year with this poverty line amount, we were able to identify government-poor counties in each of the years examined. This allowed us to make inferences

[1]This is analogous to adjusting the family poverty rate to reflect cost factors, such as size of family and availability of noncash income supplements to family income.

[2]Stinson's analysis in 1983 dealt with this problem by excluding welfare, highways, and health and hospitals spending, functions that particularly vary from State to State with respect to the State-local division of responsibility.

[3]The words "peak load" refer to situations where service needs fluctuate over time. In this case, they refer to the substantially higher number of people that must be served during peak business hours than during nonpeak, nonbusiness hours in service/employment centers. Peak-load problems refer to the high cost of providing varying levels of service.

about changes in the percentage of counties that were government poor (that is, those with governmental spending below the government poverty line).

We had no particular theoretical reason for choosing the 20-percent spending level of 1977 as a cutoff. In other words, we did not do any surveys that showed that fundamental basic public service needs were not being met below this cutoff. Such analysis was beyond the scope of our study.[4] The 20-percent cutoff was chosen mainly as a convenient point of historical reference. We thought a smaller percentage might result in only a few counties being government poor in 1987, making it hard to draw any meaningful conclusions about the types of counties that were government poor. On the other hand, a higher percentage might be hard to defend, since this might result in almost all nonmetro counties being identified as government poor back in 1962.

Our method of identifying government-poor places relies exclusively on historical (1977) spending patterns as the standard by which past and future government spending levels are judged. We did not allow the standards to increase over time. We know, however, that local government responsibilities have increased markedly in recent years. New Federal and State requirements have forced local governments to spend more on environmental protection, assistance to the physically impaired, and other functions that used to be the responsibility of Federal or State governments (or were not perceived as a public responsibility at all). The decentralized, grass-roots approach to economic development that has become popular in recent years has also added to local government responsibilities. Thus, one of the main limitations of our approach is its inability to assess the adequacy of local spending in meeting these ever-changing public service needs.

This problem has plagued all efforts to identify trends in poverty. A recent study on this topic concluded:

> Most writers on poverty, from Adam Smith to the present, have recognized that ultimately poverty is a relative concept. It is unrealistic to think that we can identify a basket of goods today, and that that same basket, adjusted only for changes in price levels, will represent minimum consumption needs in 50 or 100 years. As people's incomes rise over time, and as the available selection of goods changes, people's concept of "minimum" is bound to change also. (Ruggles, pp. 166-167.)

Alternatively, we could have allowed for rising standards over time by defining the bottom 20 percent in each year as government poor. Such an approach, however, would provide no insights on whether government services have increased or decreased over time. With our historical approach, we were able to show that most local governments that had been below the poverty line in 1977 had risen above that line by 1987. This at least suggests, though it does not prove, that public service levels have improved over time. We identified the regions and types of places where government poverty continues to be a problem.

Background and Hypotheses

This study returns to a line of research begun by Stinson in the 1960's. Stinson drew a poverty line, using unadjusted per capita expenditures, to identify government-poor nonmetro counties in 1962, 1972, and 1977.[5] He found that the number of counties below the poverty line drawn in 1962 markedly declined, from 334 (about 10 percent of the counties nationwide) in 1962 to only 10 counties in 1977. Stinson concluded:

> If one accepts the absolute standard based on the 1962 data, by 1977 virtually everyone in the United States lived in a county where expenditures exceeded the level thought minimally adequate in 1962, adjusted for inflation. Either consciously (through increased federal and state aid to local government) or accidentally, access to a minimum level of public services has been improved dramatically.

Stinson then went on to propose a "dynamic standard" as an alternative to the "absolute standard" which allows the real (inflation-adjusted) level of minimally acceptable public services to increase over time in response to increased incomes and changing tastes and preferences. Even with this approach, however, the number of government-poor counties declined by about half between 1962 and 1977.

[4] Our approach may be criticized, justifiably, as being somewhat arbitrary in basing the poverty line on the 20th percentile of government spending in 1977. However, no one has devised a poverty measure that does not involve some degree of arbitariness. Even the widely accepted official poverty rate for family income has been found to be "in many ways...a fairly arbitrary number...(and) cannot be characterized as the result of "very careful study" (Ruggles, p. 164).

[5] Stinson's unpublished (1985) analysis updated this work to 1982.

Since the 1970's, various parts of rural America have experienced serious economic difficulties associated with a major business cycle, the so-called farm crisis of the mid-1980's, and the mining and energy problems of the mid- to late 1980's. Also, from 1977 to the early 1980's, Federal aid to local governments declined in real terms. One might reasonably hypothesize that these events might reduce local expenditure levels in the affected places.

On the other hand, some nonmetro places probably benefited from economic growth over the last two decades, allowing such places to increase their real public expenditure levels in recent years. In addition, the growth of Federal and State mandates (only some of which have been funded by higher levels of Federal and State aid) could fuel expenditure growth in many nonmetro areas, including those experiencing economic difficulty.

We know from analyzing the census of governments data that average real expenditures per capita rose throughout the time period from 1962 to 1987. Thus, one might expect to see a continued trend of decreasing government poverty nationwide.

Despite increased local government spending in the aggregate, certain types of nonmetro counties are likely to have experienced increasing government poverty.[6] For example, manufacturing-dependent counties might have suffered from the recession in 1981-82, resulting in an increase in government poverty from 1977 to 1982. Farming-dependent or mining and energy-dependent counties might have reduced spending because of recent economic difficulties, resulting in a higher incidence of government poverty for those types of counties in 1987. In addition, persistent low-income counties may have experienced difficulties from declining Federal aid and the growing disparity between the rich and the poor in the 1980's, and such factors may have increased their incidence of government poverty.

In contrast, retiree-attraction counties had relatively high rates of employment growth and increases in real per capita income over the last two or three decades (Reeder and Glasgow, 1990). This trend is expected to lead to greater demands for many public services and a reduction in government poverty. This might be offset by retirees who may demand less of local education (the most costly public service). In addition, retirees in some places may have relatively low fixed incomes and so may oppose local spending and tax increases that threaten to undermine their economic well-being. Hence, it is not clear what to expect in retirement counties.

Results

The period from 1962 to 1987 was characterized by continual decline in the number of government-poor nonmetro counties (table 1 and fig. 1). The 10-year period from 1962 to 1972 contained most of the decline in the number of government-poor counties, from 1,842 to 824. The number of government-poor counties continued to drop dramatically in the next 5 years, falling to 472 by 1977. During the following 5 years, the number dropped more slowly, falling to 344, but the decline in the number of government-poor counties then accelerated during the next 5 years, leaving only 160 counties below the poverty line in 1987.

By our definition, 20 percent of nonmetro counties were below the poverty line in 1977, our baseline year. Just 15 years earlier, in 1962, 78 percent of all nonmetro counties spent less in real per capita dollars (adjusted) than this benchmark level of spending (fig. 2). By 1972, 35 percent of nonmetro counties spent less than this "poverty-line" amount. In the 10-year period from 1977 to 1987, the percentage of counties under the poverty line dropped from 20 percent in 1977 to 15 percent in 1982 and to 7 percent in 1987.

Changing Composition of Government-Poor Counties

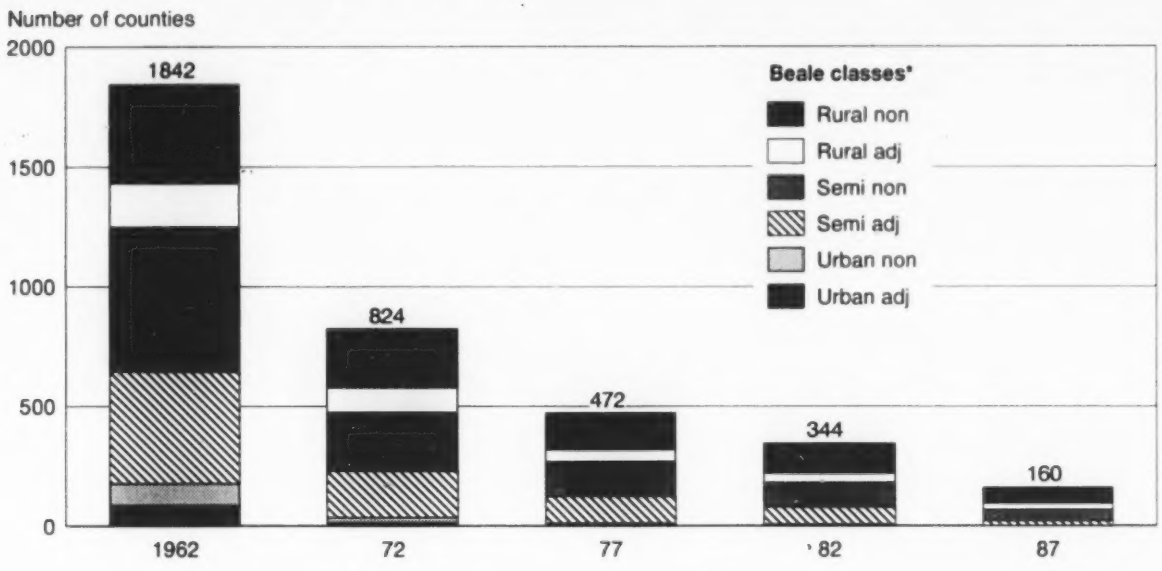
Government poverty dropped substantially for almost all types of counties (table 2). Persistent low-income counties improved the most: 97 percent were government poor in 1962, while only 19 percent were government poor in 1987, a drop of 78 percentage points. Government poverty was almost totally eliminated in mining counties as well as in Federal land and unclassified counties.[7] By 1987, no government-poor counties were left in any urban nonmetro areas (counties with urban populations of 20,000 or more), and none were found in the New England and Pacific regions.

Some general patterns have not changed much from 1962 to 1987. As was true in 1962, more low-income and retirement counties, 19 and 15 percent, were government poor in 1987 than other county types.

[6] The county typology we use was developed by ERS in the early 1980's (Bender and others, 1985).

[7] "Unclassified" counties have economies that are more diversified than other nonmetro counties.

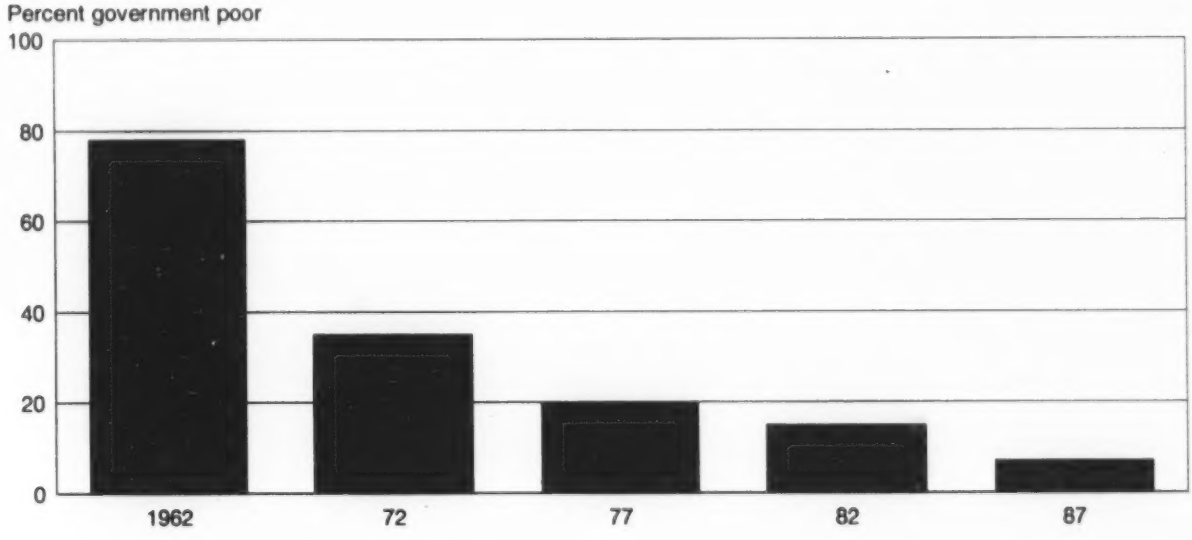
Figure 1
Distribution of government-poor counties based on adjusted real spending



*See table 1 for Beale definitions.
Note: 1967 data is no longer available.

Key: adj=adjacent, non=nonadjacent
sem-=semiurban, rural=totally rural

Figure 2
Steady decline in government poverty in rural counties, 1962-87



Note: 1987 data no longer available.

Table 1–Nonmetro county types used in figure 1 and tables 2 and 3

	Economic Types (Bender and others, 1985)
1.	Farming--farming contributed a weighted annual average of 20 percent or more of total labor and proprietor income over the 5 years from 1975 to 1979.
2.	Manufacturing--manufacturing contributed 30 percent or more of total labor and proprietor income in 1979.
3.	Mining--mining contributed 20 percent or more to total labor and proprietor income in 1979.
4.	Government--government activities contributed 25 percent or more to total labor and proprietor income in 1979.
5.	Persistent low income--per capita family income in the county was in the lowest quintile in each of the years 1950, 1959, 1969, and 1979.
6.	Federal lands--Federal land was 33 percent or more of the land area in a county in 1977.
7.	Retirement--For the 1970-80 period, net inmigration rates of people aged 60 and over were 15 percent or more of the expected 1980 population aged 60 and over.
8.	Unclassified--counties that do not fit any of the above.
	Beale Types: 1/
4.	Urban adjacent--urban population of 20,000 or more, adjacent to metro area.
5.	Urban nonadjacent--urban population of 20,000 or more, not adjacent to a metro area.
6.	Semiurban adjacent--urban population of 2,500 to 19,999, adjacent to a metro area.
7.	Semiurban nonadjacent--urban population of 2,500 to 19,999, not adjacent to a metro area.
8.	Totally rural adjacent--completely rural or fewer than 2,500 urban population, adjacent to a metro area.
9.	Totally rural nonadjacent--completely rural or fewer than 2,500 urban population, not adjacent to a metro area.

1/ This is the revised 1983 version.

However, some changes are worth noting. Semiurban counties (those with urban populations in the 2,500 to 20,000 range) used to have a higher incidence of government poverty than totally rural counties, but this ordering has reversed over time. Also, the East South Central and South Atlantic regions used to have the highest incidence of government poverty. Now, the West South Central region has the highest incidence of government poverty, followed by the East South Central region. The South Atlantic region is no longer among the poorest regions in terms of government poverty.

Figure 3 provides a picture of how different parts of rural America rose above the government poverty line over time. While much of the West from the Rockies to the Pacific Coast was already above the poverty line in 1962, the rise above the poverty line took longer for rural areas in Idaho, Utah, Arizona, New Mexico, and west Texas. And, whereas most of the central part of the country escaped government poverty by 1977, a substantial scattering of places in Nebraska and the Dakotas, many of them Indian reservations, still continue to remain below the poverty line. A thick belt of government-poor places, or of places that only recently escaped government poverty, stretches from Missouri to central Texas. Meanwhile, a scattering of government-poor places remains in the Southeast, although most of that area escaped government poverty between 1962 and 1977. The Northeast shows a more gradual trend, with the area around Vermont and western New York already above the poverty line in 1962 and much of the rest, except a few counties in Pennsylvania and Maine, escaping government poverty by 1977.

Once an area escaped government poverty, it usually stayed that way. Only seven counties returned to government poverty by 1977 that were not government poor in 1962, and all of these seven counties had once again escaped government poverty by 1987. These seven counties were included in the "not government poor in 1962" category in figure 3. Only 16 counties that had escaped government poverty by 1977 returned to government poverty by 1987. These counties were included in the "government poor in 1987" category in figure 3. Also included in this cate-

Table 2–Distribution of government poverty by type of county, 1862-87

Type of county	1962	1972	1977	1982	1987
	Percent				
Total nonmetro	78	35	20	15	7
Economic type: 1/					
Farming	79	36	20	16	8
Manufacturing	83	38	22	16	8
Mining	64	27	15	6	1
Government	73	34	20	15	7
Low Income	97	63	38	26	19
Retirement	85	54	37	29	15
Federal land	48	22	12	10	4
Unclassified	78	24	15	9	3
Beale Type: 1/					
Urban adjacent	63	11	4	1	0
Urban nonadjacent	63	15	5	4	0
Semiurban adjacent	85	35	20	13	6
Semiurban nonadjacent	80	32	19	13	6
Totally rural adjacent	82	47	23	17	12
Totally rural nonadjacent	75	45	28	23	12
Census division:					
New England	38	10	8	3	0
Middle Atlantic	70	18	5	8	3
East North Central	89	21	10	6	1
West North Central	80	33	20	15	8
South Atlantic	92	48	24	19	5
East South Central	94	53	25	16	12
West South Central	83	49	37	28	14
Mountain	39	13	5	3	1
Pacific	25	2	1	1	0

1/ Economic and Beale types given in table 1.

gory was one county that was not government poor in 1962 but returned to government poverty by 1987.

Table 3 shows the changing composition of government-poor counties by economic type. At the beginning of the study period, each economic type had roughly the same share of government-poor counties as it had of all nonmetro counties. By the end of the period, government-poor counties were disproportionately concentrated in a few economic types. By 1987, retirement counties, which made up only 20 percent of all nonmetro counties, accounted for 44 percent of government-poor counties. Low-income counties, which accounted for 10 percent of all nonmetro counties, made up 28 percent of government-poor counties in 1987. Farming and manufacturing counties also had a disproportionately large share of government-poor counties by 1987.

Retirement counties' share of government-poor counties steadily increased throughout the 25-year period. The increase for farming counties occurred entirely during 1977-87; for manufacturing counties, mainly 1982-87; and for persistent low-income counties, 1962-72, but more strongly, 1982-87.

The more general finding, that the incidence of government poverty declined in all types of counties, tends to challenge concerns that the extent and pervasiveness of government poverty has been widespread. These trends in composition of government-poor places by type of county, however, are consistent with our hypothesis that local governments in farming, manufacturing, and low-income counties have greater difficulties than do other types of counties.

The increase in the retirement counties' share of all government-poor counties was unexpected. Although most retirement counties have risen above the government poverty line over time, a significant minority of retirement counties remains in which the influx of retirees may be limiting the growth of government spending, perhaps due to political opposition to tax increases on the part of retirees. Alternatively, it is possible that some retirees are attracted to low-tax, low-spending places, so that retiree attraction may be the effect rather than the cause of government poverty.

A third explanation for the increase in the retirement county percentage of all government-poor counties may be that the attraction of retirees to places may particularly limit a government's ability to raise taxes and expenditures when the area is already afflicted with other economic difficulties. More than three-quarters of the retirement counties that were government poor in 1987 overlapped with farming, manufacturing, or low-income counties—all types of counties that have faced some economic difficulty in recent years.[8]

A fourth possible explanation involves the way we measured government poverty using per capita expenditures. Many rural communities wish to attract retirees because retirees are believed to add more to the local tax base than they add to the cost of public services. This characteristic of retirees might lead to a bias in our measure of government poverty. For example, when retirees come to an area, they may add little to the cost of education. Hence, although local spending per pupil may remain constant, we might observe that education spending per capita declines due to the increase in population (the denominator of our measure) associated with new retirees.

[8] About one-third of farming and manufacturing counties belong to at least one other economic type (Bender and others, 1985). The overlap is largest for counties in mining (45 percent), government (64 percent), retirement (65 percent), low income (82 percent), and Federal lands (83 percent).

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Figure 3
Most nonmetro counties escaped government poverty by 1987

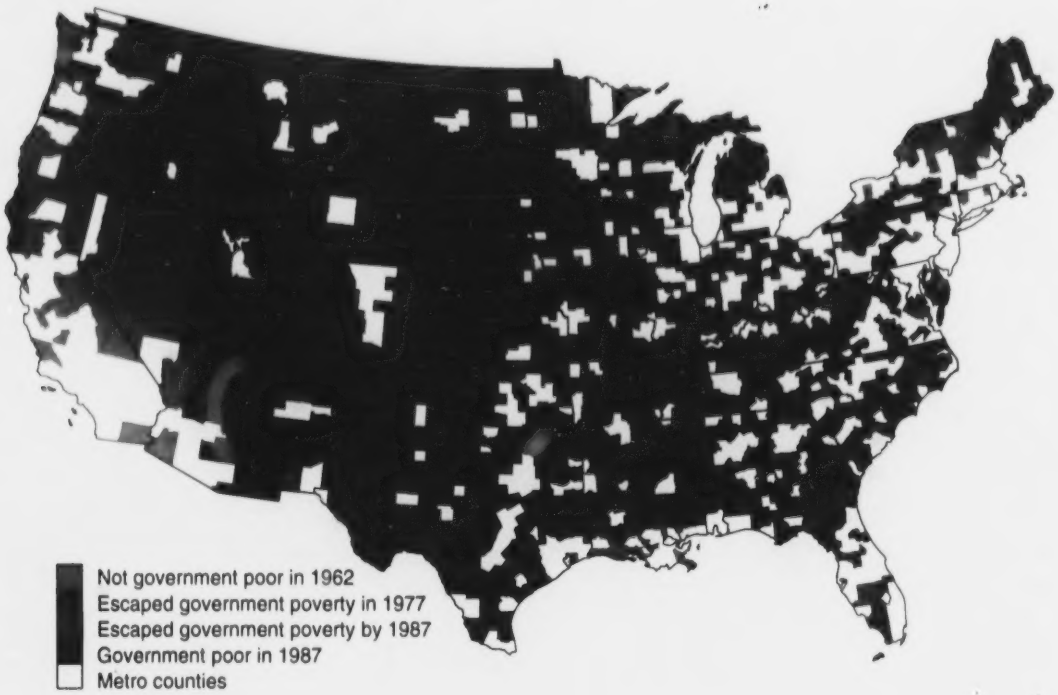
Not government poor in 1962
Escaped government poverty in 1977
Escaped government poverty by 1987
Government poor in 1987
Metro counties

Table 3--Distribution of government-poor counties by type of county 1/

Type of county 2/	All nonmetro counties	Government-poor counties				
		1962	1972	1977	1982	1987
	Percent					
Farming	29	30	30	30	33	36
Manufacturing	27	29	30	30	30	34
Mining	9	7	7	7	3	1
Government	13	12	12	13	13	13
Low income	10	13	18	19	18	28
Retirement	20	22	31	38	41	44
Federal land	10	6	6	6	7	6
Unclassified	15	15	10	11	10	8

1/ Percentage shares do not add up to 100 because of overlapping county types. If there was no overlapping, the percentage shares of each column would sum to 100.

2/ See table 1 for definitions of county types.

Socioeconomic Trends Lowered Costs and Increased Tax Bases

To gain a better understanding of why government poverty decreased in rural areas, we looked at trends in selected socioeconomic indicators thought to be related to costs and demand for local public services. To simplify the presentation of these trends, we focused on 3 years, 1962, 1977, and 1987. For each indicator, we computed the average for all nonmetro counties, plus the average for four categories of nonmetro counties: (1) those that were already above the government-poor cutoff in 1962, (2) those that were government poor in 1962 but not in 1977, (3) those that were government poor in 1977 and not in 1987, and (4) those that were government poor in 1987.

Very little overlap appears between these groups of counties. Only eight counties were not government poor in 1962 but slipped back into the government-poor category by 1977. Only 16 were not poor in

1977 but slipped back into government-poor status by 1987.

Much of the remaining discussion will focus on the fourth category, those that were government poor in 1987, which, for simplicity's sake, we will call "government poor." Although the second and third categories are also significant, representing counties that have risen over time above the government-poor cutoff, those groups will receive less attention here. The socioeconomic indicators we examined were all independent variables from our regression analysis that explained variations in local per capita spending on local government. The data in the tables consist of simple means of each variable, reflecting the average nonmetro county's situation. In other words, heavily populated counties are counted the same as less populated counties in computing these averages.

The population-based indicators reveal significant differences between government-poor counties in 1987 and counties that had escaped government-poor status by that year (table 4). Government-poor counties had substantially smaller populations, smaller population densities, and larger percentages of rural population than did counties that were not government poor. These differences in population size and density were as pronounced in 1987 as they were in 1962. Because of their greater rurality, small populations and population densitites, and diseconomies of providing services in such lightly populated places, government-poor counties tend to face not only lower levels of government services but higher costs of providing services.

Trends for these indicators show that average nonmetro county population and population density grew substantially for all county types in both time periods examined in this section (1962-77 and 1977-87).[9] Other things being equal, this increase in population and population density should reduce costs associated with the diseconomies of scale, particularly in areas that previously had relatively sparse populations.

A general decline in the rural percentage of county population also characterized most types of counties, which should also reduce government costs. The category of counties benefiting most from this decline in rural percentage of population was government poor in 1962 and not in 1977. In such counties, 3.8 percent of population shifted from rural to urban status, mostly during 1960-70. Although government-poor counties (that is, government poor in 1987) benefited from a decline in the percentage of population that was rural from 1960 to 1970, they experienced a slight increase in rural percentage from 1970 to 1980. A continuation of this more recent rural growth into the 1980's might increase costs for these counties. We did not have 1990 data to update this variable, so we do not know the trend during the 1980's.

Commuting outside the county for employment became increasingly important over time (table 4). Those counties that have relatively high percentages of residents commuting outside the county should benefit from reduced costs, since those residents will not require the county's local government services while they are gone from the county. Government-poor counties, having slightly higher than average commuting, may have benefited more from this trend than did other rural counties. The counties that benefit least from outcommuting were those that were already above the government-poor cutoff in 1962.

Another trend that may have reduced costs for local governments was the increase in State centralization of State and local government spending (table 4). Centralization has the potential to relieve local governments of responsibilities they formerly held, thereby reducing the overall cost of the total provided services. Counties that were government poor in 1962 but which rose above the poverty level by 1977 appear to have benefited most from this trend. Government-poor counties also benefited from this trend, but experienced a slight setback here during 1977-87, when the States in which they tend to be located actually decentralized spending.[10] The only type of county to continue to experience significant centralization over this latter period consisted of those counties that rose above government poverty in the previous period (from 1962 to 1977).

[9] The place categories with the most rapid increases in population were those that were not government poor in 1962 and those that rose above the government-poor cutoff most recently (in 1987). The other two categories (government poor in 1962 but not in 1977 and government poor in 1987) had smaller increases in population, particularly in the last 10 years examined (1977-87).

[10] This might indicate that the States with most of the government-poor counties experienced economic difficulties during the 1980's that prevented them from increasing State spending at the same rate as shown in other States during this period.

Table 4--Socioeconomic trends, by government-poverty status

Indicator 1/	All non-metro	Not government poor in 1962	Government poor in 1962, not 1977	Government poor in 1977, not 1987	Government poor in 1987
			Number		
Total counties	2,357	515	1,378	328	160
			Thousands		
Population:					
1962	19.8	21.2	21.1	15.2	11.8
1977	22.2	24.3	23.4	17.5	13.5
1987	23.8	26.5	24.8	19.2	14.9
			Percent		
State centralization:					
1962	40.0	41.0	39.6	40.2	40.5
1977	42.5	43.0	42.6	41.9	42.0
1987	43.0	43.2	43.4	41.7	41.7
Commuting:					
1960	10.9	8.7	11.5	12.0	10.6
1970	16.0	11.6	17.1	17.9	16.7
1980	21.1	15.6	22.6	22.9	22.2
Rural population:					
1960	75.5	69.2	75.1	80.2	90.0
1970	73.2	68.3	72.5	77.6	86.8
1980	72.7	67.8	71.9	77.1	87.3
			Persons per square mile		
Population density:					
1962	32.5	31.2	35.3	28.1	20.1
1977	36.4	35.5	39.1	31.9	22.9
1987	38.7	37.7	41.3	34.6	25.1
			1977 constant dollars		
Per capita income:					
1959	3,170	3,847	3,069	2,762	2,604
1977	5,756	6,379	5,713	5,243	4,988
1987	6,608	7,278	6,513	6,235	5,943

1/ All indicators shown in tables 4 through 7 are unweighted averages for the counties in each category. Indicator definitions and data sources used here are discussed in the text and in the appendix.

Average real income levels per capita grew rapidly during both periods and for all types of counties (table 4).[11] The rapid increase in income (and hence in wealth and local tax base) helped reduce the incidence of government poverty. Our regression analysis suggests that a $100 increase in per capita income is associated with a $4.70 increase in per capita local government spending.

Per capita income for government-poor counties experienced the most rapid rate of increase overall: 128 percent from 1959 to 1987. Although government-poor counties still have below-average incomes, such places improved their incomes compared with the nonmetro average: from 82 percent of the average in 1959 to 90 percent in 1987. In contrast, those counties that were already above the government poverty line in 1962 saw their incomes drop relative to the nonmetro average.

[11]Our per capita income data came from the Commerce Department's Bureau of Economic Analysis (BEA). These data were not available for 1962, so we used 1959 data. The reader should be aware, however, that BEA changed the way it measured income in the late 1960's, and some of the change in income we show from 1959 to 1977 may reflect changes in measurement practices rather than changes in actual income.

Table 5—Per capita local government spending, by government-poverty status

Spending category 1/	All non-metro	Not government poor in 1962	Government poor in 1962, not in 1977	Government poor in 1977, not in 1987	Government poor in 1987
			Number		
Total counties	2,357	515	1,378	328	160
			Constant 1977 dollars 2/		
Education:					
1962	227	308	211	190	175
1977	294	351	296	229	219
1987	347	411	344	301	249
Sewage/sanitation:					
1962	5	7	5	3	2
1977	8	11	8	6	4
1987	15	21	15	13	9
Highways/transportation:					
1962	55	83	50	39	38
1977	51	71	49	33	36
1987	58	85	54	41	35
Total spending:					
1962	398	581	366	306	275
1977	521	667	369	353	
1987	631	813	616	512	388

1/ All expenditures are current, general fund expenditures (excludes spending on capital construction, interest, utilities, and retirement or social insurance accounts. All expenditures are unadjusted for the factors discussed in the introduction.

2/ The implicit price deflator for State-local purchases was used to calculate constant dollars.

Spending Increased for Major Functions

Table 5 shows that the average nonmetro county's per capita local government spending in real dollars increased rapidly for all types of counties.[12] Spending increased even in government-poor counties, but the increases were substantially less than for other types of counties.

Over the entire period, the average government-poor county saw its local government spending drop as a percentage of the average nonmetro county spending, from 69 percent in 1962 to 61 percent in 1987. This growing gap between the government poor and the nonmetro average appears more dramatic when expressed in real per capita dollars, almost doubling from $123 ($398 minus $275) in 1962 to $243 ($631 minus $388) in 1987. Although this gap increased both in the earlier period (1962-77) and the later period (1977-87), most of the change occurred in the later period.

We looked at several categories (functions) of current spending in an attempt to identify which functions experienced the greatest increase (table 5). Real spending increased in all three of the functions examined, but some notable differences appeared among them.

In education, the most expensive function of local government, spending increased substantially for all categories of governments, but spending growth was uneven, resulting in a growing gap between government-poor and nonmetro counties in general. From 1962 to 1987, real spending increased 53 percent for nonmetro areas in general but increased only 42 percent for the government-poor counties.[13] During this period, the government-poor spending gap for education grew from $52 to $98.

We looked at sewage and sanitation because this was one area where we thought Federal and State environmental mandates may be causing rapid increases in

[12]This table examines actual spending levels as opposed to the adjusted spending levels we computed from our regression analysis.

[13]The category with the largest increase in education spending was government poor in 1962 but not in 1977.

Table 6--Per capita Federal and State aid, by government-poverty status

Aid category	All nonmetro	Not government poor in 1962	Government poor in 1962, not in 1977	Government poor in 1977, not in 1987	Government poor in 1987
			Number		
Total counties	2,357	515	1,378	328	160
			Constant 1977 dollars 1/		
Federal aid: 2/					
1962	5	9	5	4	3
1977	42	48	42	39	37
1987	29	38	27	27	22
State aid: 3/					
1962	171	209	164	155	151
1977	240	258	251	194	188
1987	287	319	290	253	216
Total aid:					
1962	177	218	169	159	153
1977	283	305	293	233	225
1987	316	357	318	280	238
			Ratio		
Ratio of total to all nonmetro total:					
1962	1.00	1.23	0.95	0.90	0.86
1977	1.00	1.07	1.04	.82	.80
1987	1.00	1.13	1.01	.89	.75

1/ Used implicit price deflator for State and local purchases.
2/ Excludes Federal aid that passes through State governments.
3/ Includes Federal aid that passes through State governments.

spending. As expected, we found that sewage and sanitation spending more than doubled (in real dollars per capita) over the period studied. However, current spending for this function remained relatively small, only $15 per capita (in 1977 dollars) in 1987. Most of the spending increases associated with sewage and sanitation are in the form of capital spending, which is excluded from our analysis. Capital spending was excluded because it is "lumpy," occurring in large amounts only in those years when infrastructure is acquired or built or when major repairs or renovations occur. Such a consideration underscores a general limitation of our study: that we have not assessed the condition and extent of local infrastructure and its effect on local government services.

Like sewage and sanitation, much of highway spending is in the form of capital construction, which is excluded from our analysis. Nevertheless, current spending on highway maintenance is significant for many local governments. The average nonmetro county reduced its real current spending on highways from $55 in 1962 to $51 in 1977, but in the following 10 years, this trend was reversed, with real highway spending rising to $58. This resulted in a net real increase of $3 per capita over the entire 25-year period for the average nonmetro county. Government-poor counties, in contrast, had a net $3 decrease in real highway spending, a result of a slight decline in real highway spending in both periods. Counties government poor in 1962 but not in 1977 were closest in this spending pattern to those counties government poor in 1987, exhibiting fairly stable highway spending over both periods.

When expressed in real dollars per capita, the spending gap between government-poor and average nonmetro county grew substantially more for education than for the other two functions. However, when expressed in percentage terms, government-poor counties' spending on education still appears closer to the nonmetro average than spending on the other functions we examined. By 1987, government-poor counties spent 72 percent (down from 77 percent in 1962) of the nonmetro average on education, 60 percent of the average on sewage and sanitation, and 60 percent of average on transportation. The relatively better performance in education may be due to court-

Table 7-Local government revenue and property tax effort by government-poverty status

Effort category	All non-metro	Not government poor in 1962	Government poor in 1962, not in 1977	Government poor in 1977, not in 1987	Government poor in 1987
			Number		
Total counties	2,357	515	1,378	328	160
			Percent		
Total revenue effort: 1/					
1972	6.11	7.90	5.91	4.92	4.40
1977	5.92	8.05	5.76	4.16	4.02
1987	6.85	9.01	6.62	5.74	3.71
Property tax effort: 2/					
1972	3.95	5.43	3.75	3.02	2.60
1977	3.60	5.25	3.37	2.55	2.25
1987	3.46	4.91	3.27	2.63	1.93

1/ Total locally raised general revenues (excludes utilities and retirement) as a percentage of resident personal income.
2/ Local property taxes as a percentage of resident personal income.

imposed legislation to equalize school financing that increased State aid to education and due also to Federal aid to poor school districts.

Intergovernmental Aid Growth Slowed

Real Federal and State aid increased for nonmetro counties, but grew most in the first period examined (table 6). Direct Federal aid per capita averaged only $5 in 1962, increasing to $42 in 1977 (a peak year for Federal aid) and thereafter declining to $29 in 1987.[14] Much has been made of the importance of this subsequent decline in Federal aid and its adverse effects on governments. But the decline was relatively small, in the range of about $10-$15 per capita, amounting to only 2-3 percent of total local government spending. In addition, direct Federal aid was small compared with State aid, which increased throughout this period.[15]

Government-poor counties experienced roughly the same decline in direct Federal aid as did other nonmetro counties during 1977-87. More notable is that government-poor counties received less direct Federal aid in all than did other nonmetro counties, perhaps reflecting an inability to meet matching requirements for the receipt of aid. Local governments in government-poor counties may also maintain limited staff resources and expertise for identifying grant opportunities and writing proposals for competitive grant programs.

Successful Federal grantseeking may also benefit from learning by doing. In a competitive grant situation, those with a head start in this activity may be expected to increase their advantage over other places unless a deliberate attempt is made to help the late starters catch up. For example, the most successful type of counties in receiving direct Federal aid were those that were not government poor in 1962. They began the period in 1962 with a $4 per capita head start over the average nonmetro county in Federal aid receipt. Since then, these initially successful counties have consistently added to their advantage over other nonmetro areas.

State aid is a more significant contributor to local government budgets than is Federal aid. State aid is

[14] Direct aid excludes aid that passes through State governments.

[15] The importance of Federal aid is understated in these data, however, because direct Federal aid excludes Federal aid that passes through State governments on their way to local governments. Such indirect Federal aid is included in our State aid category because that is how the census records the data.

especially important when Federal pass-through aid is included as State aid, which was the case in the census of governments data we used. State aid grew dramatically over the entire period studied, but the growth in State aid was less in government-poor counties than in nonmetro counties in general.[16] This aid gap added to the growing divergence in spending between government-poor and other nonmetro counties. The government-poor counties (government poor in 1987) received about 86 percent of the nonmetro average in total Federal and State aid in 1962, but they received only 75 percent of the average in 1987.

Local Revenue Efforts Diverged in Recent Years

The only way to make up for a growing disparity in aid receipts is to increase efforts to raise revenues locally. Local revenue efforts are defined here as locally raised taxes and user charges expressed as a percentage of local income. Income (data from BEA) is used as a proxy measure for local tax base because uniform county-level data on local property tax base is not available.

This measure of revenue effort is similar to an effective tax rate corresponding to all local revenue sources. Because we lacked a consistent time-series of local income data from 1962 to 1987, we decided to cover only the period from 1972 to 1987. During this period, the average nonmetro government increased its revenue effort, while government-poor counties decreased their revenue efforts.

Table 7 shows that all types of nonmetro counties decreased property tax efforts over this period, reflecting the Proposition 13 revolt against property taxes in the 1970's and perhaps also the decline in agricultural land values in the 1980's. Property tax effort declined in both periods examined for all except for those counties that were government poor in 1977 but not in 1987, which experienced a slight increase in property tax effort in the later period.

Most local governments have been able to draw upon other revenue sources, such as local sales taxes and user charges and fees, to make up for reduced property tax efforts. Consequently, the nonmetro average revenue effort did not decline as much as did property tax efforts during the 1972-77 period. In the subsequent 10-year period, despite a further decline in property tax efforts, the average nonmetro county substantially increased its overall revenue effort. This increase in revenue effort was much larger than the earlier decrease had been. Thus, over the entire 1972-87 period, the average nonmetro county increased its revenue effort from 6.11 to 6.85 percent of income.

Government-poor counties exhibited a very different trend, having decreased their revenue efforts throughout the years 1972-87. Property tax efforts in government-poor counties declined slightly more than those in other nonmetro counties. In addition, government-poor counties seemed either unable or unwilling to make up for reduced property tax revenues by other means, thereby experiencing a long-term reduction in total revenue effort from 4.40 percent of income in 1972 to 3.71 percent of income in 1987. This decrease in revenue effort no doubt added to the observed divergence in spending growth between the government-poor and the average nonmetro county. The extent of divergence is greatest when compared with those counties that began in 1962 as not government poor. By 1987, government-poor counties had revenue efforts that were considerably less than half the 9.01 percent of income revenue efforts of counties that were not government poor in 1962.

Conclusion

We used the level of local government spending associated with the 20th percentile of counties in 1977 as our poverty line. We found that only 7 percent of nonmetro counties were still government poor in 1987, down from 20 percent (by definition) in 1977 and down dramatically from 78 percent in 1962. These findings suggest that public services have improved substantially over 1962-87. Despite recent economic problems for many parts of rural America, inflation-adjusted government spending has continued to increase in almost all types of nonmetro areas and all regions.

Some of the observed increase in spending appears to be associated with Federal and State mandates, such as environmental requirements, but we do not know how important such mandates have been in contributing to spending growth. Spending growth has also been fueled by rising local incomes and tax bases and the associated increases in what Americans demand from their local governments. State aid growth is another factor behind local spending growth. In addition, population growth and other demographic changes, such as increased urbanization and commuting, reduced some of the costs facing rural governments. This cost reduction enabled many places to spend less for the same services or to spend more on improving government services.

[16]Those counties that rose above government poverty during 1962-77 were most successful in increasing State aid.

Our principal finding is that government services appear to have improved and that the incidence of government poverty has declined due to the growth in government per capita spending. However, we also found reasons for concern for the future of government-poor counties. Counties that were still government poor in 1987 increased their spending substantially less than did other nonmetro counties. This gap in spending between the average nonmetro county and the government-poor county (that is, those that were government poor in 1987) almost doubled (in real dollars per capita) over the period studied. Government-poor counties spent only 61 percent of the typical nonmetro county expenditure in 1987. This amounts to a 39-percent spending gap between government-poor places and the nonmetro average. A 40-percent spending gap appears for spending on highways and environmental functions (sewage and sanitation), where aid is not readily available to low-income, low-tax places. The gap is somewhat smaller (only a 28-percent gap) for spending on education, where Federal and State aid helps subsidize expenditures of low-income places.

This divergence in spending has occurred despite government-poor counties having had a more rapid increase in their tax bases, as measured by per capita income. The source of their low spending levels appears to be their relatively slow growth in per capita Federal and State aid added to their declining local revenue efforts.

All things considered, the incidence of rural government poverty may be expected to continue to decline. As long as State aid and local tax bases continue to grow in government-poor places, local governments in these places will be able to increase their spending in real dollars per capita and will ultimately surpass the poverty level as we have defined it in 1977.

If government-poor counties do not rise above the 1977 poverty line, the reason may lie in changes in the composition of government-poor counties. Retirement counties have increased their share of government-poor counties over time so that by 1987 they accounted for 44 percent of the government-poor counties. Farming, manufacturing, and low-income counties also increased their share of government-poor counties but to a lesser extent than did retirement counties. Each of these types of counties face potential economic and demographic trends that might limit their ability to increase taxes and spending. For example, farming counties can expect a further decline in population, resulting in lower taxes and higher per capita costs for local government, even if the farm property tax base remains the same. Retirement counties can expect additional inmigration of the elderly, who, at least in some places, may exert pressure to limit any tax rate increases.

Intervention by higher levels of government could overcome these problems, but such intervention may be difficult to achieve. Federal aid is not likely to grow much in the near future, given the need to reduce the Federal deficit. State aid growth may continue, but, judging by recent years, it may grow more slowly than in the past. The most popular approach these days is to provide aid only to those places that help themselves, and this means requiring matching funds from the local government or allocating aid based on local revenue efforts. With their low tax bases and low revenue efforts, government-poor places may have difficulty obtaining aid under these conditions.

Even if the remaining government-poor counties manage to rise above the 1977 poverty levels, their local government services may not succeed in keeping up with public service needs (or demands). While the government-poor and other nonmetro areas are spending more today on local government services than in the past, greater demands are being placed on government services today.

With the United States now struggling to remain competitive in the global economy, increased emphasis is being placed on the need for improved local education and infrastructure to support U.S. businesses. Environmental problems are adding significantly to the spending requirements for local governments. Local governments are also being asked to take on more responsibility for economic development policies. Are rural governments keeping up with these growing demands or falling behind them? Answers to these important questions must await further research.

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Appendix on Regression Analysis

We used a simple, single equation model to adjust local government expenditures by netting out spending variation directly associated with cost factors. Appendix tables 1 and 2 present unadjusted and adjusted totals for the number of counties below the poverty line in each State and in the United States as a whole for the 5 years examined by this study.

To determine the importance of various cost factors, a local government expenditures model was estimated:

$$E = E(X_1 ... X_n),$$

where the dependent variable, E, is local government expenditures per capita and $X_1 ... X_n$ are explanatory factors. These explanatory factors include two kinds of variables: (1) those that reflect interlocal differences in demand for local public services, such as local tax base and tastes and preferences, and (2) those that reflect differences in cost of providing local public services.

The equation above may be viewed as a simplified, single equation version of a more complex, multiple equation median voter model that Booms and Hu (1971) developed. Booms and Hu employed a five-equation model to explain per capita State and local spending on local schools.

Booms and Hu had two equations explaining the demand for and the supply of funding for local education. The demand equation explained the amount of funding per capita demanded by voters, hypothesized to be a function of (1) income and taste variables, (2) cost variables (such as school age population), (3) a tax price variable (property tax rate) inversely related to expenditure demanded, and (4) the amount of money spent on noneducation public services (a substitute good) inversely related to education funding demanded. The supply equation explained education funding supplied by State and local governments as a function of tax base, property tax rate, Federal grants to education and interest expenditures on education. A third equation explained tax price in terms of quantity of funds demanded and tax base. Of the other two equations, one determined the level of Federal education grants, while the other was the equi-

Appendix table 1--Number of government-poor counties by State, using unadjusted method 1/

States	Total nonmetro counties	1962	1972	1977	1982	1987
			Number			
U.S. total	2,357	1,127	595	472	332	156
Alabama	48	47	33	18	7	5
Arizona	12	3	0	0	0	0
Arkansas	65	65	51	40	25	22
California	27	0	0	0	0	0
Colorado	53	0	0	0	0	0
Connecticut	2	1	0	0	0	0
Delaware	2	2	1	0	0	0
Florida	36	9	1	1	1	0
Georgia	121	113	34	32	26	5
Idaho	43	6	4	0	1	0
Illinois	76	30	1	1	0	0
Indiana	62	6	4	7	5	2
Iowa	88	6	0	0	0	0
Kansas	97	1	1	2	1	1
Kentucky	101	101	95	93	85	52
Louisiana	45	29	5	4	2	1
Maine	13	11	3	0	1	0
Maryland	9	5	0	0	0	0
Massachusetts	4	0	0	0	0	0
Michigan	61	15	1	0	0	0
Minnesota	71	1	0	0	0	0
Mississippi	75	71	34	19	10	4
Missouri	98	97	48	44	36	19
Montana	54	3	1	0	0	0
Nebraska	88	4	2	2	0	1
Nevada	15	0	0	0	0	0
New Hampshire	7	5	0	0	0	0
New Mexico	30	12	1	1	1	1
New York	27	0	0	0	0	0
North Carolina	75	71	23	8	8	0
North Dakota	49	4	0	1	0	0
Ohio	52	15	5	0	0	0
Oklahoma	63	38	19	17	4	0
Oregon	28	1	0	0	0	0
Pennsylvania	34	16	10	6	5	2
Rhode Island	1	1	0	0	0	0
South Carolina	34	34	21	19	2	1
South Dakota	65	5	8	6	6	3
Tennessee	69	67	49	32	34	29
Texas	205	112	48	43	33	1
Utah	25	1	1	0	0	0
Vermont	12	7	0	1	1	0
Virginia	68	65	58	42	29	6
Washington	28	1	0	0	0	0
West Virginia	45	45	33	33	9	1
Wisconsin	52	1	0	0	0	0
Wyoming	22	0	0	0	0	0

1/ Alaska and Hawaii excluded for data reasons; New Jersey excluded because it had no nonmetro counties in 1983.

librium condition that quantity of funding demanded equal quantity supplied.

For various reasons, including the lack of local area data on some of these variables, we decided to settle for a simplified, single equation version of this model. Our single equation corresponds to the quantity demanded equation in the Booms and Hu model. It includes one public service demand factor (per capita income) and several cost factors. Since our dependent variable was spending on local public services in general, there was no need to include a separate variable for noneducation spending, as did Booms and Hu. Lacking any uniform data source for local property tax rates, we also dropped the tax price variable from the model.

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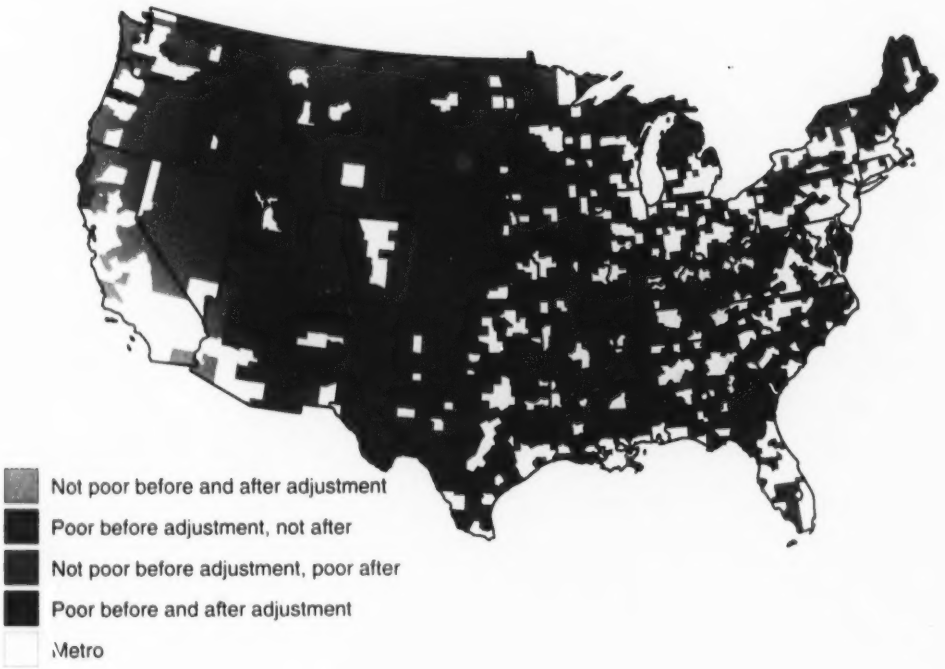
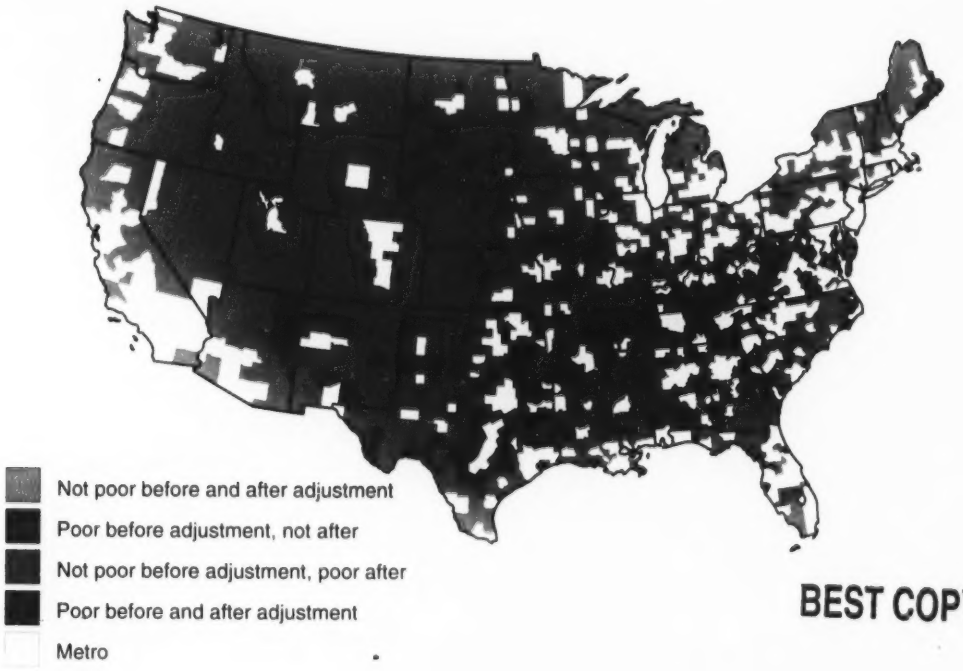
Appendix figure 1
Effects of adjustment, 1962


Not poor before and after adjustment
Poor before adjustment, not after
Not poor before adjustment, poor after
Poor before and after adjustment
Metro

Appendix figure 2
Effects of adjustment, 1977


Not poor before and after adjustment
Poor before adjustment, not after
Not poor before adjustment, poor after
Poor before and after adjustment
Metro

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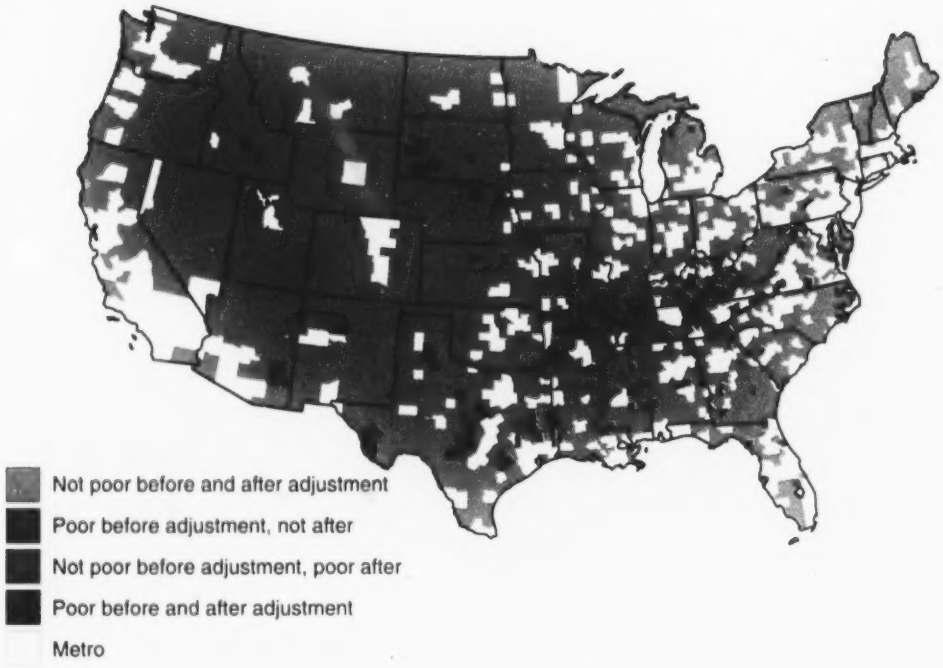
Appendix figure 3
Effects of adjustment, 1987


Not poor before and after adjustment
Poor before adjustment, not after
Not poor before adjustment, poor after
Poor before and after adjustment
Metro

Such a simplified model has some inherent weaknesses or statistical biases that should be recognized. By ignoring tax price, our model implicitly assumes that when per unit costs of providing public services rise, spending on such services will rise proportionally, implying voters will continue to demand the same quantity of public services, regardless of cost. In the real world, higher costs must be funded via higher tax rates, which reduce the quantity of public services demanded. The result is that per capita spending increases are less than proportional to increases in cost. Our regression coefficients for the cost factors are therefore expected to understate the actual impact these factors have on per capita costs of providing any given level of public services, causing us to understate the cost adjustments we make using this model.[17] Other statistical weaknesses are discussed later in this appendix.

We used ordinary least squares to perform our regression on the following equation:

$$E = b_0 + b_1X_1 + b_2X_2 .... + b_nX_n.$$

The regression was run for each of the 5 years examined to assure that the factors used in the cost adjustment were significant throughout the period. However, only the regression coefficients from the 1977 regression were used in the adjustment process.

Variables and Hypotheses

The variables in the regression model for 1977 were:

E = local government current general expenditures per capita, 1977

INTERCEP = intercept constant

POP = population size, 1977

POPDEN = population density, 1977

POPDEN2 = population density squared, 1977

[17] Another way of describing this problem is that we are estimating a reduced form equation from a multiple equation model. We are using these coefficients as if they corresponded to the coefficients of the same variables in the demand equation of the multiple equation mode. This results in biased estimates.

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Appendix table 2--Number of government-poor counties by State, using adjusted method 1/

States	Total nonmetro counties	1962	1972	1977	1982	1987
				Number		
U.S. total	2,057	1,842	824	472	344	160
Alabama	48	46	24	8	3	1
Arizona	12	10	6	3	1	1
Arkansas	65	65	46	31	23	18
California	27	2	0	0	0	0
Colorado	53	5	7	2	0	0
Connecticut	2	1	0	0	0	0
Delaware	2	2	1	0	0	0
Florida	36	36	22	12	11	4
Georgia	121	117	59	41	28	8
Idaho	43	6	4	0	1	0
Illinois	76	75	16	6	3	1
Indiana	62	48	19	14	4	0
Iowa	88	76	9	2	1	0
Kansas	97	51	23	10	8	3
Kentucky	101	89	37	16	4	1
Louisiana	45	23	7	1	1	0
Maine	13	9	2	0	0	0
Maryland	9	9	2	0	0	0
Massachusetts	4	0	0	0	0	0
Michigan	61	54	15	2	2	1
Minnesota	71	65	1	3	0	0
Mississippi	75	72	34	16	10	11
Missouri	98	98	87	73	54	35
Montana	54	3	1	0	0	0
Nebraska	88	81	23	14	14	4
Nevada	15	1	0	0	0	0
New Hampshire	7	3	1	0	0	0
New Mexico	30	23	4	3	0	0
New York	27	15	0	0	0	0
North Carolina	75	73	36	18	13	4
North Dakota	49	43	25	2	1	1
Ohio	52	49	15	8	2	0
Oklahoma	63	37	6	16	4	2
Oregon	28	7	0	0	0	0
Pennsylvania	34	28	11	3	5	2
Rhode Island	1	1	1	1	0	0
South Carolina	34	33	11	0	1	1
South Dakota	65	31	13	9	8	3
Tennessee	69	69	59	34	31	23
Texas	205	187	127	93	78	32
Utah	25	18	0	0	1	0
Vermont	12	2	0	0	0	0
Virginia	68	53	55	21	15	4
Washington	28	12	2	1	1	0
West Virginia	45	38	3	2	5	0
Wisconsin	52	45	0	1	6	0
Wyoming	22	1	0	0	0	0

1/ Alaska and Hawaii excluded for data reasons; New Jersey excluded because it had no nonmetro counties in 1983.

STCENT = State centralization (State share of total State and local expenditures), 1977[18]

INPCAP = per capita income, 1977

PCTRUR = percentage of population rural, 1980

PCTCOM = percentage of employment commuting outside of the county for employment

Current general expenditures exclude capital and interest expenditures because capital and interest expenditures are not always closely related to current levels of services. Also excluded are utilities and so-

[18]Only direct State expenditures are included in the State's share; local spending funded out of State aid is excluded as part of the State share.

Appendix table 3--Regression analysis results 1/

Variable	1962	1972	1977	1982	1987
Intercept	163.62 (17.44)	392.11 (21.84)	719.40 (20.80)	1,100.44 (19.47)	1,562.61 (21.33)
County population	2.9 x e-5 (0.30)	0.001 (6.08)	5.4 x e-4 (2.15)	6.2 x e-4 (1.69)	-2.1x e-4 (0.44)
Population density	-0.85 (13.14)	-1.46 (13.68)	-1.8 (10.59)	-2.34 (8.920)	-3.08 (8.62)
Population density squared	0.0012 (9.70)	0.002 (9.33)	0.0029 (8.26)	0.0038 (6.78)	0.005 (6.70)
State centralization (percent)	-2.66 (20.88)	-6.06 (23.79)	-10.36 (21.70)	-15.29 (17.74)	-19.47 (17.22)
Per capita income	0.069 (25.58)	0.055 (23.34)	0.047 (15.84)	0.049 (16.35)	0.05 (16.56)
Rural population (percent)	0.47 (8.81)	0.27 (2.92)	1.59 (9.94)	2.17 (8.45)	2.25 (6.23)
Commuting (percent)	-.95 (8.91)	-0.02 (1.00)	-4.60 (17.24)	-7.38 (17.24)	-11.11 (18.18)
Adjusted R-square (percent)	49	44	43	42	42

1/ Absolute value of t-ratio in parentheses. See text for data sources and data description.

cial insurance (pensions); these expenditures also do not closely reflect current service levels, and they are normally excluded from interlocal comparisons because local responsibilities vary greatly from place to place.

Per capita income is the only noncost demand factor in the model. Other demand factors were considered, including education levels of voters (often presumed to be associated with an appreciation for government services) and region (different regions are thought to have different cultural backgrounds and different views about the level of government services). These factors were not used because of statistical problems. For example, education levels may be viewed both as a cause and an effect of local government spending. In addition, education levels are strongly correlated with per capita income (simple correlation coefficient = 0.52); hence, some multicollinearity problems could result. Regional dummy variables are problematic because they may encompass both demand factors and supply (cost factors), making it impossible to separate the two effects.

Per capita income is expected to be positively associated with the demand for local public services, reflecting both the greater availability of tax revenues and perhaps a greater inclination towards consumption of public services among higher income communities.

We hypothesize that economies of scale are present in the provision and delivery of public services in rural areas. That is, per capita costs decline as the scale of activity increases. Hence, counties with large populations are expected to benefit from economies that reduce the per capita cost of providing public services. Counties with small populations are expected to experience diseconomies resulting in higher per capita costs of public services. Similar diseconomies are thought to be associated with low population density and highly rural populations (a large percentage of the population residing outside the urban areas of nonmetro counties). Some of these diseconomies may be associated more with high costs in the delivery of services (such as school busing) than with production of services.

Because some of the above cost relationships are thought to be nonlinear (for example, a U-shaped cost curve), we originally included squared versions of population-based factors in our model. The U-shaped curve implies that costs per capita decline up to a minimum-cost point, after which they begin to rise. This translates into a negative sign for population density and a positive sign for population density squared. This nonlinear specification was statistically significant for population density (both density and population density squared variables were significant). All of our observations fell on the downward sloping portion of this U-shaped curve, indicating that econo-

mies of scale were present over the entire range of nonmetro counties we examined.

We did not find a significant U-shaped relationship for the other two types of population-based variables (population size and percentage of population rural). For these two variables, we used the simple linear format. Population was hypothesized to be inversely (negatively) related to per capita costs and spending, while rural percentage of population was hypothesized to be directly (positively) related to per capita costs and spending.

State centralization and percentage of resident employees commuting outside to work are also viewed as cost factors in the sense that the availability of public services from State government or from neighboring governments can reduce the cost associated with maintaining a given level of local public goods and services. For example, two States may have the same number of road miles. The more centralized State is responsible for maintaining half of these miles, leaving the other half of the road miles to the local government to maintain. The less centralized State is responsible for maintaining only one quarter of these miles, leaving the remaining three quarters to the local governments. The local government cost of maintaining roads is lower in the more centralized State than in the less centralized State. Similarly, a residential or "bedroom" community that benefits from public service spillovers from nearby communities does not suffer from the high peak load costs that a regional service center suffers. Hence, lower costs are expected in places with a high percentage of employees commuting outside the county. A negative sign is expected for the coefficients for each of these two variables, State centralization and percentage of employees commuting outside the county.

Our adjustments for costs associated with population, commuting, and local government responsibilities bear some similarity with the work of Bradbury (1983), Ladd and others (1986), and Rafuse (1990). The findings of these studies were not directly transferable because they focused on large cities or States and their cost/need indicators differed from those we used. The choice of indicators is important because some indicators have substantially different implications in rural areas than in urban areas (Reeder, 1990).

Data Sources

County-level expenditure data for fiscal years 1962, 1972, 1977, 1982, and 1987 are from the U.S. Department of Commerce, Bureau of the Census, census of governments, file B government finance data. The year 1967 was omitted because we lacked a computerized data tape for that year. The 1962 county-level finance data tapes were originally provided to the Economic Research Service over 15 years ago and are no longer available from the census.

Population and per capita income data are from the U.S. Department of Commerce, Bureau of Economic Analysis (BEA) and reflect calendar years 1972, 1977, 1982, and 1987. No BEA population and income data were available for 1962, so we used 1960 census population for the population variables in the regression analysis explaining 1962 spending. We estimated 1962 population for each county using 1960 population and a rate of change computed from 1972 and 1960 population. This estimated county population was used only to compute per capita expenditures in 1962 (the dependent variable). We also tried the regressions using the estimated population for 1962 in our population variables, with little difference in results. Lacking BEA data for income in 1962, we used 1959 per capita income from the old BEA data series as the income variable in our 1962 regression analysis. The revised BEA income series was used for the later years in the analysis.

The State centralization variable is from the census of governments. It is a State-level variable, identical for all counties within a State, but varying from State to State.

Data on the percentage of population residing in rural portions of the county and the percentage of employees commuting to work outside the county are from the census of population. At the time our data set was compiled, these data were available only for 1960, 1970, and 1980. For these variables, we used 1960 data in the 1962 regression, 1970 data in the 1972 regression, and 1980 data in the 1977, 1982, and 1987 regressions.

Regression Results

The focus of our analysis was the 1977 regression, since 1977 was close to the midpoint of our time period. The coefficients from this regression were used as weights to estimate the adjustment factors for each of the years analyzed.

At first, we experimented with additional cost-related variables and various forms. For example, we tried a climate variable, on the assumption that cold weather would add to costs for places in cold climates, but this variable was discarded for lack of statistical significance. We initially used a metro adjacency 0,1

dummy variable to reflect the availability of metro area public services, but then replaced it with the commuting variable, which explained more variation (a higher adjusted R-square statistic). We ended up with the seven independent variables described previously.

The regression coefficients for all seven of the independent variables used in 1977 were statistically different from zero at the 95-percent level of confidence (app. table 3). All except population size (POP) had the expected sign. We kept population size in the equation only because it was significant for 1977. However, we did not use it to adjust expenditures for cost factors because it had an unexpected sign (positive) and because it was not significantly different from zero for most of the other years we examined.

This regression model explained about 43 percent of the variation in local per capita expenditures in 1977. Although we would have preferred a higher adjusted R-square, this is an acceptable level in a cross-sectional analysis, and it explained more variation than we had expected.

The regressions for the other years produced similar estimates for most of the variables (app. table 3). Aside from the population size variable mentioned above, the other six independent variables had consistent signs and were statistically significant in almost all of the regressions. One exception was the percentage of workers commuting, which was not statistically significant in 1972, though it had the expected sign. We suspect this failure to achieve statistical significance may be a result of errors in the secondary data source for this variable.

Comparing regression results from one year to another revealed that most of the coefficients increased in absolute value over time. This was expected because the dependent variable was nominal and increased with inflation, while the independent variables (with the exception of per capita income) were real (nonmonetary) and did not increase with inflation.

The range of coefficients was as follows:

POP close to zero in all equations

POPDEN -0.87 in 1962 to -3.87 in 1987

POPDEN 20.001 in 1962 to 0.005 in 1987

STCENT -2.68 in 1962 to -19.4 in 1987

INPCAP 0.047 in 1977 to 0.073 in 1962 -

PCTRUR 0.273 in 1972 to 2.246 in 1987

PCTCOM -0.02 in 1972 to -11.1 in 1987

Perhaps the most notable change over time was the amount of explained variation (adjusted R-square). This model explained half (0.495) of the variation in per capita government spending in 1962. The explanatory power of the model declined to 0.440 in 1972, 0.434 in 1977, 0.416 in 1982, and 0.420 in 1987.

One possible explanation for this decline in explanatory power is the increase in the extent to which Federal and State governments are mandating public services. Increased variability could result from variations in how these mandates are imposed and enforced from State to State. A related explanation is that the rapid growth in Federal and State aid during the 1960's and early 1970's may have led to levels of public services in many areas that were higher than can be explained by local characteristics.

Adjusting Expenditures

The first step in computing adjusted expenditures was to compute an adjustment factor, ADJ, to be subtracted from real per capita expenditures in each year. ADJ was computed using the coefficients obtained from the 1977 regression and applying them to the cost-related independent variables (POPDEN, POPDEN2, STCENT, PCTRUR, PCTCOM) to form a weighted average:

$$ADJ_i = b_1POPDEN_i + b_2POPDEN2_i + b_3STCENT_i + b_4PCTRUR_i + b_5PCTCOM_i,$$

where b_1 through b_5 are the regression coefficients obtained from the 1977 regression analysis and i represents the year (1962, 1972, 1977, 1982, and 1987) for the independent cost variables and the adjustment factor. In other words, one set of coefficients (those from the 1977 regression) was used to adjust expenditures for all study years. Each year's adjustment, however, employed that year's values for the independent variables.

An alternative approach would be to apply each year's set of coefficients to that year's set of independent variables. Although this may be more intuitively appealing and more accurate for removing the effects of these variables in any given year, changes over time become hard to interpret. Some counties would rise or fall out of government-poor status, not because of any change in their situation

relative to other counties but because of year-to-year changes in the regression coefficients that may be statistically insignificant. The decision was made to go with the one set of coefficients due to the greater ease in interpretation.

The adjustment factor (ADJ) varies from county to county and from year to year because of variations in the independent cost factors used to compute the adjustment factor. Once the ADJ is computed, it can be subtracted from the real per capita expenditure variable for each county in each year. Real, as opposed to nominal, per capita expenditures were used in order to make meaningful comparisons over time. Real expenditures for each year were expressed in constant 1977 dollars.[19] The resulting adjusted expenditures were also expressed in constant 1977 dollars.

The adjustment method we used appears to have been successful in that the variation of adjusted expenditures dropped considerably from that of actual expenditures. We expected this, given that the adjustments were meant to remove distortions associated with cost variations.

One limitation of this adjustment method is that the absolute values of the adjusted expenditures have no monetary meaning in themselves. Because of the way the adjustment factor was constructed, adjusted expenditures average about $400 above the actual per capita expenditure levels. While this makes it impossible to compare adjusted expenditures with actual expenditures, it presents no problems for this study's main objectives, which are to examine the variations in adjusted expenditures and government poverty rates over time and across counties.

Comparing Adjusted and Unadjusted Government Poverty

Does adjusting expenditures make much difference when it comes to identifying government-poor counties? To answer this question, we drew poverty lines using both adjusted and unadjusted expenditures and compared our results (see app. tables 1 and 2).

The method used to draw the adjusted expenditure poverty line was discussed in the introduction section of the text. The task involved drawing a poverty line at the 20th percentile of counties based on their adjusted local government spending in 1977. This level of spending is used in connection with the adjusted spending of counties in other years (expressed in constant 1977 dollars) to delineate government-poor counties in those years (app. table 2). The same general approach can be used with unadjusted expenditures. In this case, the poverty line is drawn at the 20th percentile of unadjusted government spending in 1977, and this level of spending is used in connection with unadjusted spending in other years (expressed in constant 1977 dollars) to determine poverty status of counties in those years.

By definition, both methods produce the same number of government-poor counties in 1977 (472 counties or 20 percent of all nonmetro counties). The two methods differ over which counties are government poor in each of the 5 years and the number (and percentage) of counties that are government poor in years other than 1977.

A comparison of appendix tables 1 and 2 shows that our adjustment method made the biggest difference in 1962, the earliest year examined. In 1962, the adjusted method yielded 1,842 (out of a total of 2,357 nonmetro counties) government-poor counties (app. table 2); the unadjusted method yielded only 1,127 government-poor counties (app. table 1).

Most of this difference was in the Midwest and the Central States (see app. fig. 1). In these regions, large numbers of counties drop below the 1977 poverty level after adjusting for costs. This was expected because many of these counties had very low populations and population densities prior to the rural boom in the late 1960's and early 1970's. This meant that per capita costs were notably higher in 1962 than in later years. Adjusting for these higher costs in 1962 was expected to drop many of these counties below the 1977 poverty line.

Relatively few counties in 1962 were below the unadjusted poverty line but above the adjusted poverty line. These were mostly in the Appalachian mountains and in Louisiana. The only States where unadjusted government-poor tallies exceeded those of the adjusted government poor by more than a couple of counties were Kentucky, Louisiana, and West Virginia.

With the 1977 data, when 80 percent of the counties were above the poverty line by definition, regardless of the method used, the regional differences between the two methods are more apparent. Most of the places where adjustments drop a county below the poverty line are west of the Mississippi river, with the heaviest concentration in a band from Missouri to Texas (app. fig. 2). Places that are raised above the

[19]The implicit price deflator for State and local government purchases of goods and services was used to convert to constant dollars (Economic Report of the President).

poverty line by the adjustments are mostly found in the South, with the heaviest concentration in West Virginia and Kentucky.

In the years from 1977 to 1982, the number of adjusted government poor fell to 344, indicating less improvement in government poverty than was reflected in the 332 unadjusted government-poor counties recorded in 1982. In the following 5 years, however, greater improvements were measured with adjusted figures than with unadjusted figures. As a result, the two approaches produced a nearly identical number of government-poor counties in 1987.

By 1987, however, the number of government-poor counties were so small that regional patterns are harder to see (app. fig. 3). Using both methods, a large majority of government-poor counties were found in only a handful of States. Three States—Arkansas, Missouri, and Tennessee—had a relatively large number of government-poor counties, regardless of the method used. Mississippi and Texas had a relatively large number of government-poor counties when adjusted figures were used; Kentucky was the single State with a large number of government-poor counties when unadjusted figures were used.

Statistical Weaknesses in Our Model

Any attempt to use government spending data as a proxy for the level of government services is subject to various statistical problems. We have already referred to one of the statistical problems with our model—that the equation we tested is really a reduced form of a two- (or more) equation model, in which the expenditure variable is both caused by and affects other variables in the system, including tax price. This problem results in biased cost estimates. Specifically, a more sophisticated, two-stage estimation model might identify higher costs associated with some of the independent variables. Such a model might be expected to result in higher government poverty rates for the more rural, high-cost communities.

Other statistical problems may result from our use of only a handful of cost variables. Other cost variables could be employed that reflect the need to spend more dollars per capita in places where there are more public service needs per capita. For example, suppose we could have identified the added costs of education associated with relatively large school age populations and high family poverty rates. We then would have found lower costs (and hence lower government poverty rates) associated with retirement counties and higher costs (higher government poverty rates) associated with places with high family poverty rates. We excluded these variables from our analysis because these same variables may be associated with both cost and noncost demand factors. Our simple adjustment method cannot distinguish between cost effects and noncost effects.

For instance, a retirement county may spend less per capita on education because it has a relatively small school age population, or if retirees act in their self-interest and oppose proposed tax increases for education, from which they do not directly benefit. In this case, both the cost and the noncost effects on per capita spending are hypothesized to be negative. If we were to assume that the entire observed effect was cost related, then netting out these costs would understate the government poverty rates of retirement counties. If we were to assume that the entire effect was noncost related, then the effect would be the same as excluding the variable; that is, to overstate the government poverty rate of these places.

A place with high family poverty rates may need to spend more on school to overcome its more extensive educational disadvantages, which should add to the cost of education. But poverty populations often have relatively little political power. Hence, spending in many places with high poverty rates is expected to be lower than in other places, making it hard to detect the higher costs associated with educating poor populations. In addition, poverty rates, like some other socioeconomic variables, are highly correlated with local income levels (our chief noncost demand factor), so adding it to our model might create multicollinearity problems. By excluding family poverty rates from our model, however, we understate the costs associated with places with high poverty.

Although we excluded from our analysis most of the variables that could be interpreted as both cost and noncost factors, one such variable that remained in our analysis was our State centralization variable. This variable should be inversely related to local government costs because State centralization reflects greater availability of State-provided substitutes for local public goods. However, State centralization may also occur where local governments choose to spend relatively little or are unable to afford much spending on public services, while the State (perhaps relying on a different tax base) is able to spend somewhat more.[20] In such cases, State centralization may be the

[20]This may be particularly true in low-income, low-government spending areas in States where the State government raises substantial revenues from energy and mining operations

effect, rather than the cause, of low local government spending.

Thus, our analysis may involve simultaneous equations bias by failing to include State centralization as an endogenous variable. This would mean that we overadjust for cost differences associated with State centralization, with the result that we understate the government poverty rates in highly centralized States where this reverse causality is important. This may explain some of the more pronounced interstate differences we observed in government poverty.

The most conspicuous example of this bias associated with our State centralization factor may be in Kentucky. This is a State with a large number of low-income counties that spend relatively little on local government services, but with a State government that ranks 10th in the Nation in severance taxes and 3rd in State centralization. After adjusting for State centralization and other cost factors, we found that Kentucky had only one government-poor county. But, when we had computed government poverty without making these adjustments, Kentucky had 52 government-poor counties (out of 156 nationwide). A more reasonable, unbiased estimate probably lies between these two figures.

We may also have some bias problems with our commuting variable. The reason for including this variable as a cost variable is that places with larger percentages of residents commuting outside the county for work do not face the same peak load costs as do places that serve as centers of employment. However, a potential problem exists with intertemporal comparisons because the overall level of commuting has increased markedly over the years. It seems likely that costs have not declined by a proportionate amount for most nonmetro areas because many are fixed costs and cannot be reduced. In addition, both incommuting and outcommuting may be increasing in many places, and to ignore the incommuting, as we have done, may result in overstating the cost advantages of increased outcommuting in these places. The net result is that in recent years we may be overstating cost reductions in many places due to our specification of commuting, and this in turn may understate the number of government-poor counties.

Another difficulty concerns the problem of using a monetary measure of public service levels, which ignores public services that flow from nonmonetary factors, such as volunteer labor. The availability of volunteer labor and of nonmonetary gifts (such as computers given to schools) varies considerably from place to place. One particular concern in this area involves the probability that higher income communities have access to more nonmonetary inputs than lower income communities. A similar problem results from our using current spending, which ignores the benefits that flow from capital infrastructure. For example, a policeman with a car radio can provide more services than one without a radio.

Another problem involves lightly populated counties that have signficant Federal or State prisons. Such institutions add to county population and thereby reduce county per capita spending on local government services. This should, however, have little effect on local government services for nonprison populations. Thus, these counties probably should not be viewed as government poor. Several of our government-poor counties, such as Union County, FL, Lincoln County, AR, Grand County, AZ, and Anderson County, TX, fell into this category.

Counties with significant Indian reservations may also present a problem for our analysis. Indian reservation expenditures on public services are not included in the census of governments data we used. If tribal expenditures had been included, some of the counties in the Dakotas, Minnesota, and Arizona that we identified as government poor might have been considered above the government poverty line.

Finally, the most obvious statistical problem involves our inability to distinguish between places that spend money efficiently and places that spend money inefficiently. This problem arises with trends as well as with cross-section comparisons. Many people complain that the dramatic spending increases of local governments have been wasteful, resulting in little real improvement in public services. For example, many States have increased teacher pay in general, with relatively little of this spending increase directed to recruiting higher quality teachers or to performance-based incentives for existing teachers. Thus, our finding that there are fewer government-poor counties today may reflect, in part, more waste in government rather than improved government services.

Other difficulties involved the data we used. In constructing the data set for government expenditures, we found various inconsistencies between published data and data from our computer tapes. We resolved some of these problems, but others remained. For example, the difference between the published national totals and the totals of current general expenditures that we obtained by aggregating all counties together varied by as much as 5 percent in 1972. (The published to-

tals were lower than our computed totals.) Some of this difference reflects metro areas and may be irrelevant to our analysis, but we do not know how much is attributable to metro areas. Some of the difference may be due to errors in published data, and some may be due to errors in our computer data. No such problems were found in our data for 1987, so we have more confidence in identifying the government poor in this year, our most recent year for which data were available.

Despite these statistical and data quality problems, we feel that adjusting expenditures represents an improvement over unadjusted expenditures. Our effort should be viewed as a first attempt in this area and not as a definitive report. Greater improvements could be made by using a more sophisticated model, but this was beyond the scope of our analysis.

Conceptual Problems in Interpreting Our Findings

Whether one adjusts or does not adjust expenditure data, conceptual problems make it difficult to interpret our government poverty findings in a way that is meaningful to today's national policy debate. The most important of these problems involves the difficulty of using historical spending data to make inferences about whether spending is sufficient to meet current public service demands when these demands increase over time.

Our whole approach involves drawing a poverty line for a particular year (1977) and comparing spending in various years to that poverty line. We merely defined the lowest 20 percent in adjusted spending as government poor. This is a relative measure, indicating a relatively low level of public services. It does not indicate whether these places spent amounts sufficient to meet existing public service demands in 1977. Moreover, trend comparisons to this historical 1977 standard do not take into account the increase in public service needs over time.

Hence, these results should be interpreted with caution, recognizing that some of the counties we indicate as government poor may actually be providing an acceptable level of services, while others we show as above the poverty line may actually be providing an inadequate level of services.

U.S. Department of Agriculture
Economic Research Service

SUMMARY OF REPORT #SB-884

Large, Specialized Farms Bring Most Profits; Small Farms Show Most Losses

June 1994

Contact: Charles B. Dodson, (202) 219-0801

A new report gives detailed information on farm business profits during 1987-91 among the various U.S. regions, farm types, and sizes of enterprise. The report, *Profitability of Farm Businesses: A Regional, Farm Type, and Size Analysis*, from the USDA's Economic Research Service, uses recent data to show the wide income variance among farms, a third of which are not profitable, and shows the major part played by larger and more specialized farms in the total production of U.S. agriculture. Average returns on assets including capital gains are determined for farms of various regions, types, and sizes. Farm incomes are compared against the returns of U.S. Treasury bills on the same value of capital investment.

Major Producers Are Specialized

Specialized farms controlled nearly 72 percent of all farm business assets in 1987-91. Over 50 percent of U.S. beef production came from specialized beef farms with annual sales of more than $100,000. Dairy farms with annual sales of more than $250,000 accounted for 47 percent of U.S. dairy production. About 35 percent of all cotton was produced on farms with annual sales greater than $250,000.

A single commodity accounted for over 50 percent of total production on nearly 70 percent of U.S. farms and sometimes made up almost all production. On specialized cotton, fruit and nut, nursery, peanut, tobacco, and vegetable farms, the specialized commodity made up more than 75 percent of individual farm production.

Larger Farms Are Much More Profitable

Larger farms tended to show the highest incomes, with many receiving cash incomes of more than $100,000 a year. Farms with annual sales greater than $250,000 represented 7 percent of all farms but controlled 50 percent of total U.S. production. Farms with annual sales of more than $50,000 accounted for two-thirds of the production of fruit and nuts, vegetables, cotton, nursery products, and sugar beets.

Some Smaller Farms Showed Profits

During 1987-91, farms with annual sales of less than $40,000 contributed only 9 percent of total production, compared with farms with sales of $250,000 or more, which contributed 51 percent of total U.S. production. The smaller farms represented 68 percent of all farms and controlled 41 percent of all assets, but they contributed less than 20 percent of production of most commodities. These farms were most likely to report negative returns. A third of all U.S. farms had negative incomes. But, small was not always unprofitable. Some small farms showed profits; what made some small farms profitable is not clear.

To Order This Report...

The information presented here is excerpted from ***Profitability of Farm Businesses: A Regional, Farm Type, and Size Analysis***, SB-884, by Charles B. Dodson. The cost is $9.00.

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Economic Research Service

SUMMARY OF REPORT #AER-695

Entry, Exit, and The Decline in Farm Numbers

October 1994

Contact: Fred Gale, 202/219-0594

More than 500,000 older farmers will exit the farm sector between 1992 and 2002, to be replaced by about 250,000 new young farmers. Farm numbers may decrease to about 1.7 million by 2002, down from 2.1 million in 1987. The decline in farm numbers does not threaten the Nation's food supply, because each farm operator today produces a larger output than farm operators in past decades. A new report from USDA's Economic Research Service, *The New Generation of American Farmers: Farm Entry and Exit Prospects for the 1990's*, projects farm entries to continue at low levels.

During the 1950's and 1960's, farm numbers declined by more than 100,000 per year, as farmers of all ages left to pursue nonfarm occupations. During the 1970's, the exodus from farming slowed, as the income gap between farm and nonfarm households narrowed. In recent years, shortrun economic conditions that affected the balance between retiring older farmers and new younger farmers have influenced the rate of decline. Strong entry by young farmers during the 1970's stabilized farm numbers, but lower entry during the 1980's accelerated the decline. Farm numbers have continued declining in the 1990's.

Declines in the number of children raised on farms have shrunk the pool of potential young farm entrants. The pool of potential farm entrants is expected to continue shrinking. The number of 20-29 year olds raised on farms will fall from 671,000 in 1990 to 375,000 in the year 2000.

The average age of U.S. farm operators was 52 years in 1987, up from 51.7 in 1974 and 51.3 in 1964. In 1987, 45 percent of U.S. farm operators were at least 55 years old, while 13 percent were under age 35. About half of the Nation's 279,000 farmers under age 35 are located in three regions: Lake States, Corn Belt, and Northern Plains.

The Decline Will Be Slow

The annual decline in farm numbers between 1992 and 2002 is projected at an average 1.3 percent. The projected 1.7 million farms in 2002 is higher than earlier projections based on 1969-74 data, but lower than a projection based on 1974-78 data. The fastest declines are predicted for the Appalachian, Delta, and Southeast regions, while less change is expected in the Mountain, Pacific, and New England regions. The average age of farmers is expected to continue rising through the 1990's.

Projected change in U.S. farm numbers, 1992-2002[1]

Exit of older farmers will exceed entry of young farmers.

Item	Farms
	Thousand
Projected number of farms, 1992	1,980
Operators aged 44 and younger, Projected net entry per year, 1992-2002	258
Operators aged 45 and older, Projected net exit per year, 1992-2002	523
Net change in farm numbers, Average per year, 1992-2002	-266
Projected number of farms, 2002	1,714

[1]Includes farms with agricultural sales of at least $1,000 per year.
Source: 1987 Census of Agriculture, and age cohort projection by the author.

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The information presented here is excerpted from ***The New Generation of American Farmers: Farm Entry and Exit Prospects for the 1990's,*** AER-695, by Fred Gale. The cost is $9.00.

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